

The Haberdashers' Aske's Boys' School Elstree



11+ Entrance Examination 2014

MATHEMATICS

One Hour

Full Name.....

Examination Number

INSTRUCTIONS

1. DO NOT OPEN THIS PAPER UNTIL YOU ARE TOLD TO DO SO.
2. There are 30 questions on this paper. DO NOT FORGET TO TURN OVER.
3. Work quickly but accurately. You are recommended to use pencil, but you can use pen or biro if you wish.

WRITE YOUR ANSWERS TO THE QUESTIONS IN THE SPACES PROVIDED.
YOU MAY USE THE SPACE AT THE BOTTOM OF EACH PAGE FOR WORKING.

Answer

1. Add: $29 + 35$ _____
2. Subtract: $92 - 67$ _____
3. Multiply: 34×9 _____
4. Divide: $87 \div 3$ _____
5. Write the number twenty-four thousand and twenty-four in figures. _____
6. Round 567 to the nearest 100. _____
7. What number do you multiply 0.2 by to get an answer of 6? _____
8. If 7 tennis lessons cost £167.65 what is the cost of 1 lesson? _____
9. The safety notice in a lift reads:

Maximum 6 persons 580 kilograms

The weights of the first five people to enter the lift are 90 kg, 80 kg, 95 kg, 115 kg and 89 kg.

What is the maximum weight of the sixth person in the lift if they all travel together safely? _____
10. Each branch of the flowering shrub, *Mathematicus arithmetica* has 5 stems. Each stem has 8 flowers and each flower has 11 petals. If a shrub has 3 branches, how many petals does it have? _____

SPACE FOR WORKING

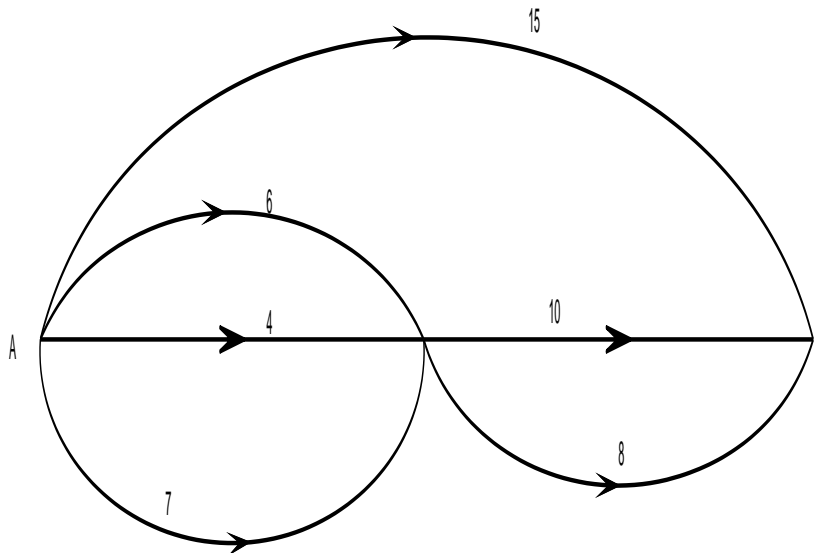
Answer

19. The diagram shows the one-way cycle paths in a town. The diagram is not to scale but the distance along each section of the route is shown and is measured in kilometres.

How many possible routes are there in total from A to B?

How long is the shortest distance from A to B?

_____ km



20. A tortoise and a hare take part in a race which has a staggered start in order to make the race fair.

The hare needs to run a distance of 400 metres to cross the finishing line whereas the tortoise only needs to travel 1.5 metres. The hare runs at a speed of 800 metres per minute. At what speed (in metres per minute) does the tortoise need to run to cross the finishing line at the same time as the hare?

_____ metres per minute

SPACE FOR WORKING

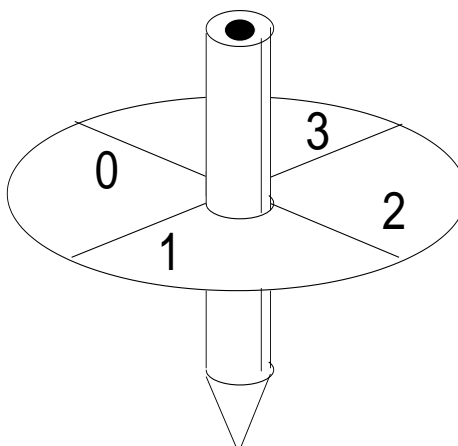
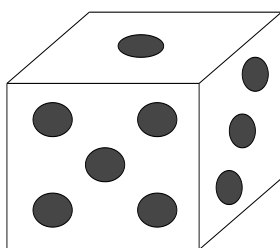
21. John experiments by rolling a single dice and a spinner simultaneously. He rolls an ordinary dice with a possible score of 1, 2, 3, 4, 5 or 6. At the same time he also spins a spinner with a possible score of 0, 1, 2 or 3. His total score is worked out by multiplying the two individual scores together.

Complete the table below to show all 24 equally likely final scores.

Score	1	2	3	4	5	6
0						
1			3			
2						12
3				12		

If he repeats this experiment lots and lots of times, what fraction of the total scores are

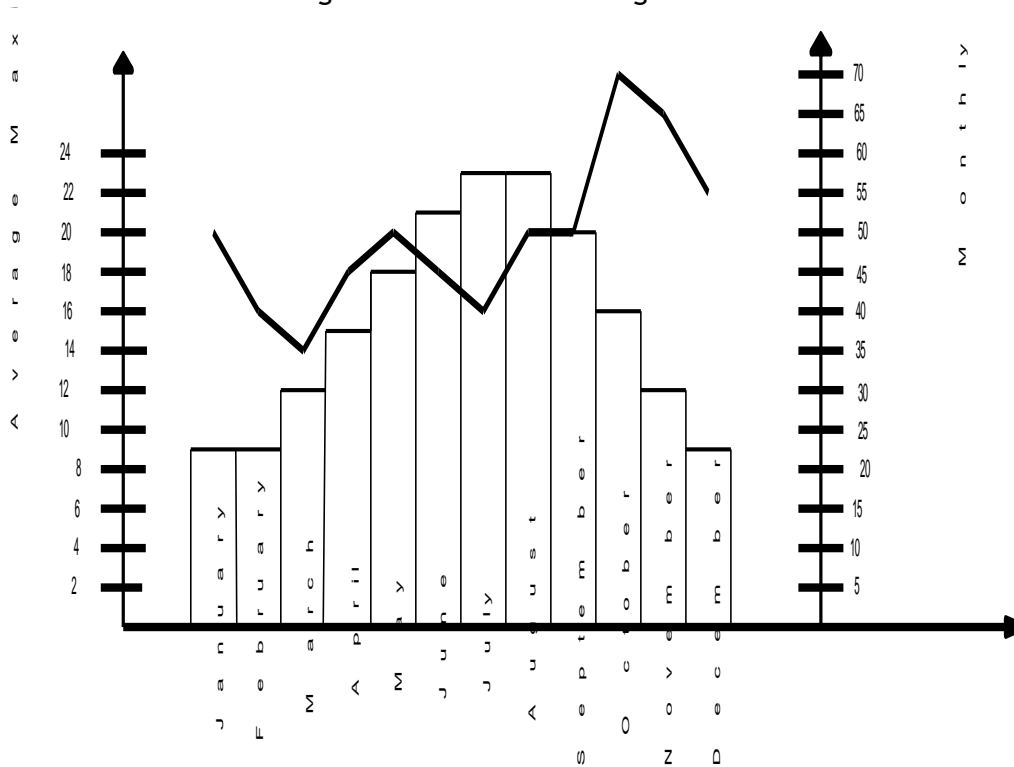
- (a) 0 _____
- (b) 12 or more? _____



SPACE FOR WORKING

22. The bar chart shows the average maximum monthly temperature for London. The scale on the left-hand side of the diagram is measured in degrees Centigrade.

The line graph gives the total monthly rainfall for London. The scale on the right-hand side of the diagram is measured in millimetres.



What is the average maximum temperature in October? _____

Which two months are the hottest? _____ and _____

Which is the driest month of the year? _____

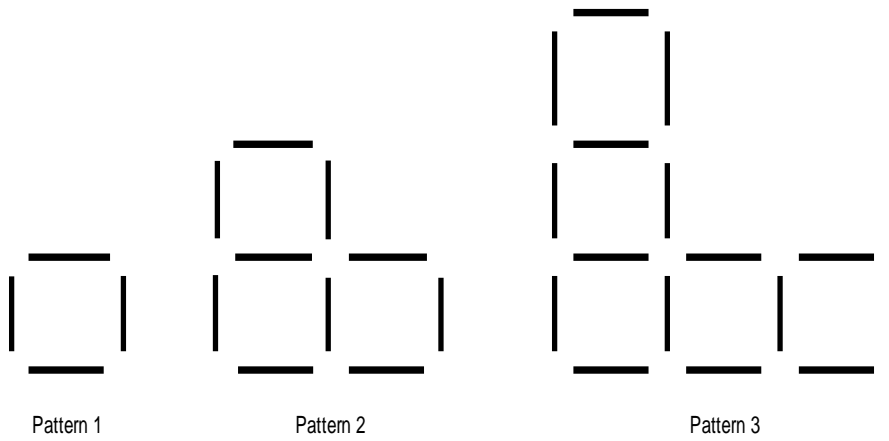
The average rainfall for the first three months of the year is

$$\frac{50 + 40 + 35}{3} = \frac{125}{3} = 41\frac{2}{3} \text{ mm}$$

Work out the average rainfall for the last three months. Give your answer as a mixed fraction.

SPACE FOR WORKING

23. Amar makes patterns out of sticks:



Draw Pattern 4 and complete the table.

Pattern Number	Number of Sticks
1	4
2	10
3	16
4	
7	
	70

Pattern 4

SPACE FOR WORKING

Answer

24. The time in Adelaide (Australia) is 8 hours 30 minutes ahead of the time in London. The time in San Francisco (America) is 8 hours behind the time in London.

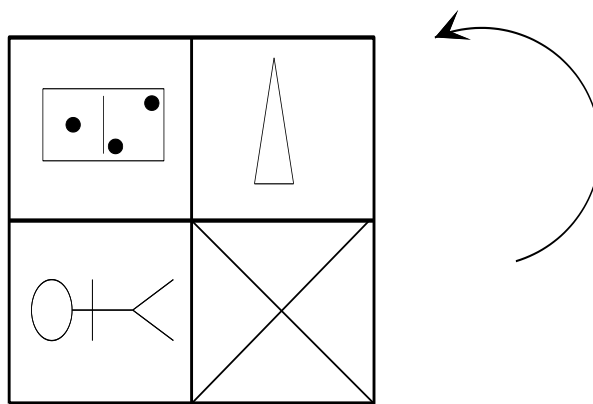
If it is 8:45 pm on 10th January in Adelaide what is the time and date in London?

Time is _____ and date is _____

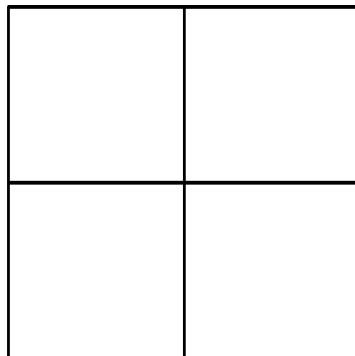
If it is 9:23 am on 30th September in San Francisco what is the time and date in Adelaide?

Time is _____ and date is _____

25. Mr T has designed the kitchen tile shown below:

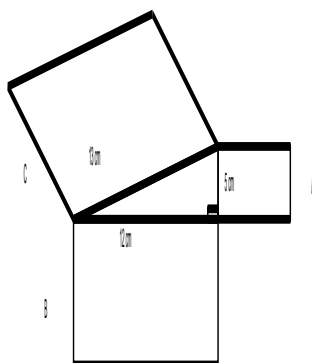


Show what this tile will look like after it has been turned through ninety degrees anti-clockwise.



SPACE FOR WORKING

26. The diagram below (not to scale) shows three squares stuck onto the sides of a right-angled triangle with sides of lengths, 5 cm, 12 cm and 13 cm.

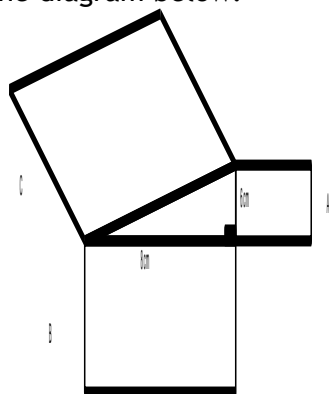


Complete the table to show the area of each square and hence write down a simple connection between the areas of the squares A, B and C.

Square	Area of Square
A	25 cm^2
B	144 cm^2
C	

Connection between the areas of squares, A, B and C: _____

Assuming that this connection works for all right-angled triangles, work out the length of square C in the diagram below:



Length of square C: _____

SPACE FOR WORKING

27. My friend George is really good at maths so I decide to ask him some tricky questions to see if I can catch him out. Needless to say he got all three questions right!

Write George's answers in the spaces provided.

George's Quiz

Question 1

If it takes 90 minutes for two identical towels to dry on a washing line, how long would three of these towels have taken to dry?

Question 2

In the winter, I try and climb up an icy slope starting at the bottom. Each time I make a move I find that I go up four metres but then slide back down two metres. How many moves do I need to get to the top which is 8 metres up the slope from the bottom?

Question 3

The area of mould growing on my bathroom wall doubles every day. After 13 days the area covered is 2880 cm^2 . After how days did the area first exceed 300 cm^2 ?

SPACE FOR WORKING

28. We write $S(2,5)$ as an abbreviation for $2+3+4+5$ so that $S(2,5) = 14$.

Similarly,

$$S(6,39) = 6+7+8+9+\dots+38+39 = 765$$

Work out:

$$S(1,3) \quad \underline{\hspace{2cm}}$$

$$S(6,40) \quad \underline{\hspace{2cm}}$$

$$S(7,38) \quad \underline{\hspace{2cm}}$$

$$S(1,2) - S(2,3) + S(3,4) - S(4,5) + \dots - S(18,19) + S(19,20) \quad \underline{\hspace{2cm}}$$

29. Freddie writes down all whole numbers between 1 and 1000 inclusive:

1, 2, 3, 4, ..., 9, 10, 11, 12, 13, ..., 99, 100, 101, 102, 103, ..., 999, 1000.

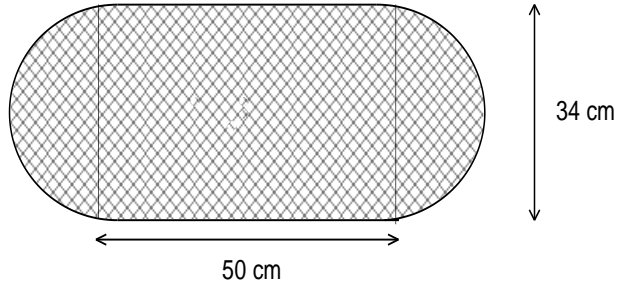
How many individual digits does he write down?

SPACE FOR WORKING

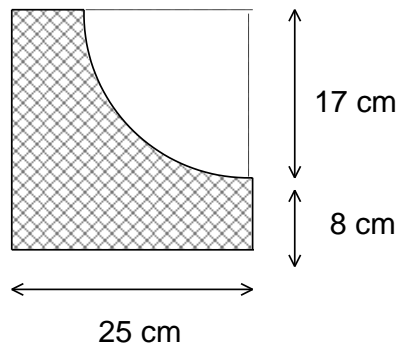
PLEASE TURN OVER. THE LAST QUESTION IS ON THE BACK PAGE.

30. The area of a circle with diameter 34 cm is 908 cm^2 .

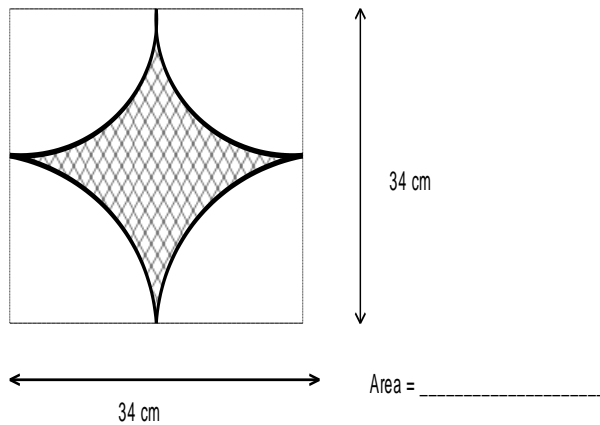
Use this fact to work out the area of each of the shaded regions shown in the diagrams (not drawn to scale) below.



Area = _____



Area = _____



Area = _____

SPACE FOR WORKING

Now go back and check all of your answers carefully.